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vol. 25
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PAARA

Graphs



palo alto
AMATEUR
RADIO ASSN.

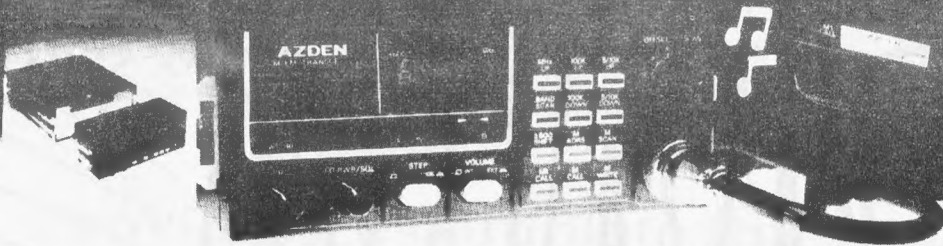
MENLO PARK C.D. RADIO CLUB, K6YQT

SHAVER RADIO, INC.

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1378 S. BASCOM AVE. SAN JOSE, CALIF.

New! AZDEN® PCS 3000 BLAZING THE FRONTIER OF MICROCOMPUTER COMMUNICATIONS



**SUPERIOR
COMMERCIAL GRADE
2-METER FM TRANSCEIVER**

INTRODUCTORY OFFER
\$339⁰⁰

FREE TOUCH-TONE® PAD KIT INCLUDED.

COMPARE THESE FEATURES WITH **ANY** UNIT AT **ANY** PRICE

- **5 MHz FREQUENCY COVERAGE, INCLUDING CAP/MARS BUILT IN:** Receive and transmit 142 000 to 149 995 MHz in selectable steps of 5 or 10 kHz. **COMPARE!**
- **SIZE:** Unbelievable! Only 6 1/4" by 2 1/4" by 9 1/4". **COMPARE!**
- **MICROCOMPUTER CONTROL:** All frequency control is carried out by a microcomputer.
- **MUSICAL TONE ACCOMPANIES KEYBOARD ENTRIES:** When a key is pressed, a brief musical tone indicates positive entry into the microcomputer. **COMPARE!**
- **PUSHBUTTON FREQUENCY CONTROL FROM MICROPHONE OR PANEL:** Frequency is selected by buttons on the front panel or microphone.
- **3 CHANNEL MEMORY:** Each memory channel is reprogrammable and stores the frequency and offset. Memory is backed up by a NICAD battery when power is removed.
- **INSTANT MEMORY 1 RECALL:** By pressing a button on the microphone or front panel, memory channel 1 may be accessed immediately.
- **MEMORY SCAN:** Memory channels may be continuously scanned for quick location of a busy or vacant frequency.
- **PROGRAMMABLE BAND SCAN:** Any section of the band may be scanned in steps of 5 or 10 kHz. Scan limits are easily reprogrammed.
- **DISCRIMINATOR SCAN CONTROL (AZDEN EXCLUSIVE PATENT):** The scanner stops by sensing the channel center, so the unit always lands on the correct frequency. **COMPARE** this with other units that claim to scan in 5-kHz steps!
- **THREE SCAN MODES WITH AUTO RESUME:** 'Sampling' mode pauses at busy channels, then resumes. 'Busy' mode stops at a busy channel, then resumes shortly after frequency clears. 'Vacant' mode stops at a vacant channel and resumes when signal appears. If desired, auto resume may be prevented by pressing one button. **COMPARE!**
- **REMOVABLE HEAD:** The control head may be located as much as 15 feet

- **PL TONE OSCILLATOR BUILT IN:** Frequency is adjustable to access PL repeaters.
- **MICROPHONE VOLUME/FREQ. CONTROL:** Both functions may be adjusted from either the microphone or front panel.
- **NON-STANDARD OFFSETS:** Three accessory offsets can be obtained for CAP/MARS or unusual repeater splits. CAP and Air Force MARS splits are **BUILT IN; COMPARE!**
- **25 WATTS OUTPUT:** Also 5 watts low power to conserve batteries in portable use.
- **GREEN FREQUENCY DISPLAY:** Frequency numerals are green LEDs for superior visibility.
- **RECEIVER OFFSET:** A channel lock switch allows monitoring of the repeater input frequency. **COMPARE!**
- **SUPERIOR RECEIVER:** Sensitivity is better than 0.28 uV for 20-dB quieting and 0.19 uV for 12-dB SINAD. The squelch sensitivity is superb, requiring less than 0.1 uV to open. The receiver audio circuits are designed for maximum intelligibility and fidelity. **COMPARE!**
- **ILLUMINATED KEYBOARD:** Keyboard backlighting allows it to be seen at night.
- **TRUE FM, NOT PHASE MODULATION:** Transmitted audio quality is optimized by the same high standard of design and construction as is found in the receiver. The microphone amplifier and compression circuits offer intelligibility second to none.
- **OTHER FEATURES:** Dynamic microphone, built-in speaker, mobile mounting bracket, external remote speaker jack (head and radio) and much, much more. All cords, plugs, fuses, microphone hanger etc. included. Weight 6 lbs.
- **ACCESSORIES:** CS-ECK 15-foot remote cable... \$35.00 CS-6R 6-amp ac power supply... \$59.95 CS-AS remote speaker... \$18.00 CS-TTK touch-tone® microphone kit (wired and tested)... \$39.95.

PAARAgaphs is the official organ of

The Palo Alto Amateur Radio Association and the Menlo Park Civil Defense Radio Club

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Written contributions to the P.O. Box above.

R E G U L A R M E E T I N G

Friday September 11, 1981

7:30 pm

Vacation DXpedition

by

Steve Thomas - N6ST

Steve, who resently gave an account of his three week April DXpedition to the Northern California DX Club, will tell us how to really take a vacation. Besides exploring a volcano, the normal tourist traps, and sailing race week, he found time to work Antigua, St. Kitts, and Montserrat on the other end of the pile-up. If you didn't work N6ST on 20 meters, come to the meeting and work him on 2 meters; if you did, come anyway and have an eyeball.

FUTURE MEETINGS: October 2, November 6, December 4, 1981

Auction & Flea Market, October 10, 1981

Circle the date

September 11, 1981

not make use of it? That's all for now,
so 73's de Art, K6OV

PRESIDENT'S CORNER: I have extended PAARA's regrets to the family of Kurt Kanthack, WD6BGV, who passed away recently. Our roster of silent keys seems uncommonly active recently. The absolute, official Field Day score was submitted at the end of the month by Fred, K6YT. In the midst of poor reports by other groups, our effort looks competitive indeed. It attests to an excellent combination of operators, equipment, antennas, and a large and active support group. Details elsewhere. At least one person claimed an exact answer to KB6W's puzzle of last month.

Summer meetings are not always well attended and last month's was no exception, (about 35). You missed a good speaker on NASA Ames if you weren't there. Start saving your money and your junk for the October 10 PAARA Auction and Flea Market. I will be checking on interest in a Fall picnic at the next meeting. My thanks to Dave, KB6W for delivering the bones of the present issue before leaving on a trip to the East Coast. We are still publishing by committee, and need a focal point type person to bring the great leadership qualities of the past back to PAARagraphs. de Gerry, WA6LNV

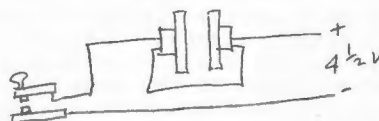
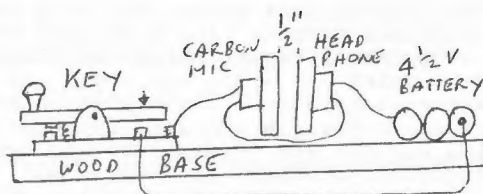
DEFINITION CORNER: TVI - A disease of the optic nerve characterized by wiggly lines, caused by watching too many daytime soap operas.

FOR OVERSEAS TRAVELLERS: If you are travelling in Europe, on vacation or business, you may be interested to know that many countries have some English language programming, including news on their broadcast-band stations.

From Practical Wireless, here is a list.
Great Britain - domestic. 200KHZ (1500 meters) for Radio 4; 1053KHZ (285 metres) and 1089KHZ (275 meters) for Radio 1; and 693KHZ (433 meters) and 909KHZ (330 meters) for Radio 2.
Great Britain - world. Main freq. is 648KHZ (463 meters) but at times on 810 KHZ (370 meters) and 1296KHZ (231 meters) and during the night on 200KHZ (1500 meters).

American Forces Network. 873KHZ (343 meters) Frankfurt; 1107KHZ (271 meters) Munich; 1107KHZ (271 meters) Berlin; and two chains on 1143KHZ (263 meters) and 1485KHZ (202 meters). There are ten VHF stations on 87.87MHz in West Germany and a station on 100.9MHz in Brussels.
British Forces Broadcasting Service. 99.8MHz Bonn; 99.3MHz Hamlin; 87.8MHz Verli; 95.4MHz Herford; 96.5MHz Langenburg; 97.6MHz Visselhoud and 98.75 Berlin. In Holland, 101.2MHz Maastricht and 101.7MHz Hoensbroek.
Austria. 102.2MHz Vienna from 0600-0800, 1100-1300 and 1700-1830. News, weather and traffic in English on 585KHZ (513 meters) Vienna and 520KHZ (577 meters) Innsbruck/Linz/Liezen.
West Germany. 1269KHZ (236 meters) Deutschlandfunk 1840-1930 weekdays and 1800-1830 Sundays.
Voice of America. 1197KHZ (250 meters) Munich 0300-0400, 0430-0500, 0600-0700 and 1700-1730.
Luxemburg. 1440 KHZ (208 meters), from 1900 and continues well into the night. Also, 92.5MHz from 1300-1630 and 97MHz from 0000 -0200.
Denmark. 1062KHZ (282 meters), together with 15 VHF channels has news at 0715 during the summer.
Sweden. 1179KHZ (254 meters) daily at 1600 with repeats at 1830 and 2300.
Finland. 254KHZ (1181 meters) Lahti; 558KHZ (538 meters) Helsinki; and 963KHZ (311 meters) Turku, all daily at 2030 carrying the English section of the overseas service.
Iceland. 1485KHZ (202 meters) American base at Keflavik.
France. During July and August, 164KHZ (1829 meters) 0900 and 1600.
Spain. 1458KHZ (206 meters) Radio Gibraltar; 87.6MHz Marbella has English/German programs; and 93.5MHz British Forces Broadcasting Service.
Morocco. 702KHZ (427 meters) Sebba Aïoun 0900-1200.
Algeria. 254KHZ (1181 meters) Radio Algiers 2000-2030.
Canary Islands. 1215KHZ (247 meters) in Swedish/German/English 0900-1000 and 1800-2000.
Madeira. 1485KHZ (202 meters) 0815-0915 and 1800-1900.
Malta. 1557KHZ (193 meters) 1835-1850.
Italy. 846KHZ (355 meters) Rome and 900KHZ (333 meters) Milan have news in English on the hour between 2300 and 0500. 1368KHZ (219 meters) Naples has programs for NATO personnel during

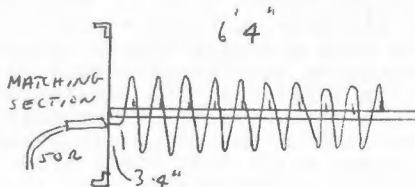
the weekends. **ERTS (US Forces)** 106 MHz from Liviano, Geta, Livorno, M. Virgine, Naples, Rimini, Sigonella and Verona and 107MHz from San Vito and 108MHz from Vicenza, all 0500-2300. **Greece.** 729KHz (412 meters) plus 17 VHF stations have news on Saturday at 0530 and weather reports daily at 0430. The Night Program on 666KHz (450 meters) starting at 2300 is in English and other languages. **Yened (Greek Armed Forces)** has news on weekdays at 1225 and 1925. The main transmitter is on 981KHz (306 meters) Athens, with relays on 765KHz (392 meters) Ioannina, 945KHz (317 meters) Larissa, 954KHz (314 meters) Iraklion, 1080KHz (278 meters) Orestias, 1179KHz (254 meters) Thessaloniki, 1278KHz (235 meters) Florina, 1314KHz (228 meters) Tripolis, 1475KHz (202 meters) Myrghos and 1602KHz (187 meters) Kavalla and Kozani. **U.S. Forces (AFRTS)** 1584KHz (189 meters) Athens and Iraklion and 1485KHz (202 meters) Kato Souli are 24-hour stations. **Voice of America** 792KHz (379 meters) at 1930 from Kavalla; 1260KHz (238 meters) from Rhodes from 0400-0600 and again at 1630. **Vatican.** Religious programs 1530KHz (196 meters) at 1445 and 2030. **Cyprus.** British Broadcasting Corp. world service relay to the Middle East on 693KHz (433 meters) and 1323KHz (227 meters) from 0300-2315 daily. **Bulgaria.** 774KHz (388 meters) Radio Varna 0600-1200, with news at 0605, 0905 and 1155. **Romania.** 756KHz (397 meters) daily at 2230.



Everything is in series and the note is determined by the spacing between the microphone and the headphone.

FOR THOSE WITH LOTS OF CHOUSTICKS: The June 1981 magazine Radio Communication, a publication of the Radio Society of Great Britain, has a ten-turn choistick helical antenna for 435.215MHz clockwise circular polarization. The antenna is 6ft. 4in. long and has a gain of 13-14 db and a beam width of 40 degrees. The conductor is RG58, the outer conductor doing the radiating. There are ten turns along the boom, supported every 90 degrees by choisticks and there is a 28 in. square reflector. The feed point impedance is 140 ohms, so a short matching section is used to get to 50 ohms. The reflector is made from metal screen, braced by some aluminium angle.

The author claims good results on Oscar 7 mode B, uplink, and mode J downlink.



FROM THE TREASURER: when the time comes to pay your ARRL subscription, why not pay it through the club? The club gets a 32 commission on each renewal through it. All you have to do is make out your check to PAARA and give it, with the QST mailing label, to the Treasurer, or, if you can't make it to the meeting, mail it to P.O. Box 911, Menlo Park.

ELFA MARKET: Foothill Amateur Radio Society at Foothill College Parking Lot 1, from 9 to 2 on Saturday, the 19th of September. The call-in frequency is 147.45 MHz and the seller charge is \$5.

FIELD DAY STATISTICS: from the final score sheet, there were 1959 CW QSOs, with a multiplier of two; and 2930 phone QSOs with a multiplier of one. A DC input multiplier of two applied to all QSOs and there were 900 bonus points for a total of 14,596 points.

This compares with 12,582 in 1979 and 14,464 in 1980.

CODE PRACTICE OSCILLATOR: all that is needed is a carbon microphone and a headphone, although you may need to try several headphones to get one of the right impedance.

COMPUTER CORNER: Baud rates, the term baud often confuses people. And with good reason. It means different things depending on who is using the term, and when. In its narrowest technical definition, a baud is defined as being a measure of the rate at which signals are transmitted through a communications channel, with one baud corresponding to a rate of one signal element per second.

Well, that sounds pretty straightforward, but what's a signal element? With digital data it seems pretty reasonable that a signal element should be the same thing as a bit so that 300 baud would be the same thing as 300 bits per second. Right? Well, sometimes.

Baud rate is concerned with the stuff (like tones) going down the communications channel (in this case a phone line), and NOT with the stuff (like ones and zeroes) we're turning it into at the other end. In a 103-type modem (modulator-demodulator each possible change from one frequency to the other is a signal element. Since that is how we code a single bit, one baud equals one bit per second. But the phone line has a very finite rate at which it can carry signal elements. The rate is related to the frequency range the line can accommodate and the modulation technique (as well as the error rate one is willing to tolerate). In general, 1200 baud is about the highest the phones will accommodate with any degree of reliability. So the fastest that a modem can be is 1200 baud (unless you're using some other kind of telephones).

Well where do 4800-baud modems come from then? Well, the answer is that they are not 4800-baud modems at all. They are 4800 bit-per-second modems. They do it by very cleverly encoding 4 bits of digital data onto a single signal transition (corresponding to a single cycle of a 1200 Hz carrier tone). As you can imagine, it is quite a trick encoding them that way, and even more of one to get them back out at the other end. That's why they're so expensive -- it ain't easy.

But that's not the only confusing part. As data communications users, you and I don't care how many funny little bauds go down the phone line. In fact we really don't care about the bits even. We are trying to get some bytes moved around, but we'll probably settle for moving ASCII characters.

So how fast can we send characters with a 300 bit-per-second modem? Usually about 30 characters per second, but it can vary.

You see, in order to be able to pick the characters out at the receiving end, we have to put on some extra bits to tell where the character begins and ends, etc. So our 7-bit ASCII character is accompanied by one start bit, one stop bit, an optional parity bit for error-checking, and an optional extra stop bit (I don't quite know why, it just slows things down). Thus our ASCII character could get from 2 to 4 extra bits travelling companions.

The most common usage is one each of start bits, stop bits, and parity bits. This works out nicely because that means 10 bits per character which makes the character rate at 300 baud simple to calculate as 30 characters per second.

Normally, there is no good reason to transmit any slower than you have to (you just get a bigger phone bill), except that it won't work if you send faster than whatever's at the other end can receive it (like CW). There are an awful lot of model 33 teletypes still kicking around. They can send and receive only at 110 baud. Between all those TTY's and the machines built to talk to them, there are still a lot of 103-type modems connected to things that only run at 110 baud. Next month we'll look at parity error checking, 73's de #65*p.

POST 599 CORNER: First on the list: Thanks are due to Fred, K6YT, for his help in transporting our new 30 foot Tri-band collapsible antenna to K6OTR's doorstep and his help in arranging its donation. Thanks to Fred, it will soon be in extensive use by the post at our shack.

Secondly, there is, of late, no new news on K6OTR/R450, but nevertheless, it is slowly progressing. At last notice, we have a tentative site for our new repeater. (We have the machine itself; we just don't have anywhere to put it.) However, we do have a frequency: 442.8 MHz. More news on that next time.

And last, but not least, some repeater news: as you probably already know, the post presently operates a 2 meter repeater K6OTR/R, on 144.57/145.17. It covers most of the Palo Alto area, but has a relatively low usage compared to some of the other local repeaters. There are times when it seems awfully quiet. If you're in the neighborhood sometime, drop on in and give it a try. If more traffic passes through it each day, there is more reason to keep it operating. It's there; why



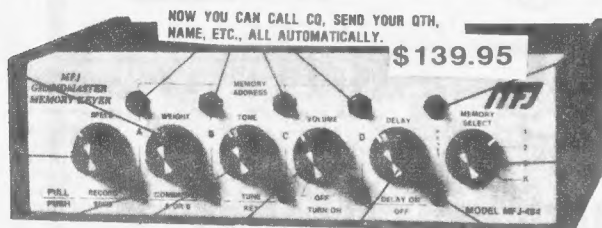
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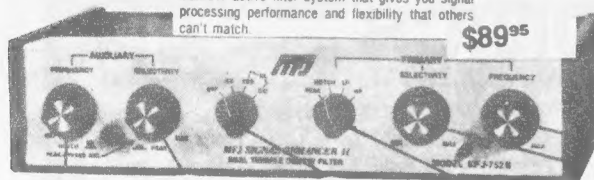
NEW MFJ MFJ-484 GRANDMASTER



NOW YOU CAN CALL CQ, SEND YOUR QTH, NAME, ETC., ALL AUTOMATICALLY.

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MFJ-752B Signal Enhancer is a dual tunable SSB/CW active filter system that gives you signal processing performance and flexibility that others can't match.

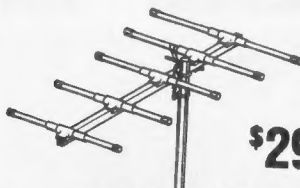


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This new **MFJ-624 Telepatch II** hybrid phone patch gives you a combination of performance, features, and quality that you won't find in other phone patches.



\$59.95



\$29.95

STINGER A 2-5 DESCRIPTION

The model Stinger A 2-5 is a five-element high gain antenna similar to the A 2-10 but having physically less of a profile. The A 2-5 finds excellent application as a portable antenna as it disassembles into a very compact package. Like the A 2-10, the antenna can be mounted for vertical or horizontal polarization for repeater or general coverage work. Constructed of the Stinger heavy duty materials, the A 2-5 is ideal for locations encountering adverse weather conditions. Power rating 2,000 watts P.E.P.

SPECIFICATIONS - A 2-5

ELECTRICAL-
Forward Gain 9.5dB
Front-to-Back Ratio 22dB
V.S.W.R. (at resonance) 1.1:1
Half Power Beam Width 51°
Bandwidth 144 to 148 MHz
Impedance 50 Ohms
Matching System Adjustable Gamma

MECHANICAL-
Boom Length 5.5 ft.
Longest Element 41 in.
Turning Radius 42 in.
Maximum Surface Area 1.23 sq. ft.
Wind Load at 80 MPH 13.3 lbs.
Weight 6.5 lbs.

TELE-COM

MFJ-402 8044 ECONO KEYS HAS BUILT-IN PADDLE, WEIGHT AND SPEED CONTROL.

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MFJ-1020 \$79.95
Indoor Active Antenna



\$69.95

Instantly zero in a SSB/CW signal and eliminate QRM. The **MFJ-751 Signal Enhancer** is a tunable SSB/CW active filter.

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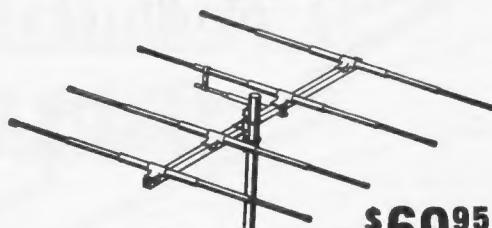
MFJ-830 HF SENSOR.



MFJ RF NOISE BRIDGE
Model MF J-2102

\$54.95

This new **MFJ-202 RF Noise Bridge** lets you quickly adjust your single or multiband dipole, in verted Vee, beam, vertical, mobile whip or random system for maximum performance.



10 meter \$69.95

STINGER A 10-4 DESCRIPTION

The model Stinger A 10-4 is a wide spaced, full size, high gain four element 10-meter monobander designed for optimum DX performance. Utilizing the exclusive Stinger Series square boom construction, the A 10-4 is light enough to be easily stacked for an additional 3 dB gain yet strong enough to withstand the most adverse weather conditions. The highly efficient gamma match system easily withstands 2,000 watts P.E.P. of power and maintains a relatively low V.S.W.R. across the entire 10-meter amateur band.

SPECIFICATIONS - A 10-4

ELECTRICAL-
Forward Gain 10dB
Front-to-Back Ratio 25dB
V.S.W.R. (at resonance) 1.1:1
Half Power Beam Width 55°
Bandwidth 28 to 30 MHz
Impedance 50 Ohms
Matching System Adjustable Gamma

MECHANICAL-
Boom Length 16 ft.
Longest Element 18.2 ft.
Turning Radius 7.4 ft.
Maximum Surface Area 4.4 sq. ft.
Wind Load at 80 MPH 118 lbs.
Weight 12.5 lbs.

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